Franch. are common and the broadleaf trees are nearly all deciduous. At 8000 ft. and upwards the wooded regions are more extensive and several species of Fir and Spruce form fine forests. The open country above this altitude is clothed with Bamboos, a great variety of shrubs, coarse herbs and *Juniperus squamata* Lamb. but nowhere in this part of China can the vegetation be called alpine in character.

Below an altitude of 3000 ft. no broadleaf evergreen Rhododendron is found though the red-flowered *R. Simsii* Planch. belonging to the Azalea group abounds and in season the countryside is ablaze with its blossoms of intense color. On conglomerate rocks near Ichang the yellow-flowered *R. molle* G. Don grows sparingly. In rocky places among shrubs the lilac-flowered *R. Mariesii* Hemsl. & Wils. is found at elevations between 1000 and 3000 ft. In wet sheltered glens among a rich growth of evergreen broadleaf shrubs *R. pittosporaefolium* Hemsl. occurs as an occasional bush at altitudes between 3500 and 5000 ft. but is nowhere a common plant. It is in the copses and woods above 4000 ft. that evergreen broadleaf Rhododendrons grow in Hupeh. They increase in number as the altitude increases and are common between 6000 and 10000 ft. though never so abundant as they are in western Szechuan where they dominate the higher forests and form magnificent belts of color. In the woods and copses of Hupeh among broadleaf deciduous and evergreen trees they grow as scattered bushes or in small groups whereas in the coniferous forests they are a most important undergrowth often forming dense thickets. Above 8000 ft. Rhododendrons grow in more open country among other shrubs, and in rocky places where there are no trees to give it overhead shade *R. Fargesii* Franch. in pure stands often covers large areas.

I never met with *R. sutchuenense* Franch., *R. auriculatum* Hemsl., *R. discolor* Franch. or *R. Houlstonii* Hemsl. & Wils. elsewhere than in woods and forests but the other species often grow in places where they do not receive the overhead shelter of trees. Indeed, *R. Augustinii* Hemsl., *R ovatum* Planch. and *R. micranthum* Turcz. grow best on the edge of woods and on cliffs where they get almost complete exposure and are never found within the full shade of wood or forest. *R. Wilsonae* Hemsl. & Wils. likes the companionship of deciduous shrubs and small trees but not that of evergreens, be they broadleaf or coniferous. Woods in which Oaks are the dominant trees are a feature of the vegetation of Hupeh and it is in these that the Rhododendrons which do not grow above 7500 ft. altitude are most found, luxuriating in the thick layer of humus which covers the forest floor.

The most widely distributed of the endemic species are *R. hypoglaucum* Hemsl., *R. sutchuenense* Franch., *R. maculiferum* Franch. and *R. discolor* Franch. Very local is *R. auriculatum* Hemsl., known only from a few localities and in these quite rare. *R. sutchuenense* Franch. is found at the lowest altitudes of any of the evergreen broadleaf species and it is the first to open its blossoms; *R. maculiferum* Franch. and *R. Fargesii* Franch. grow at higher elevations than other Hupeh Rhododendrons and next to them in this respect comes *R. adenopodum* Franch. No small-leaved Rhododendron of the class which covers so many hundreds of square miles of the Chino-Thibetan borderland has been discovered in western Hupeh or eastern Szechuan, neither can Rhododendrons be termed a dominant feature of the vegetation in these parts of China. They are, however, a fairly common and strikingly beautiful element of the flora.

Of the eighteen species nine are not known to grow elsewhere though one (*R. hypoglaucum* Hemsl.) is very closely related to a species indigenous in western Szechuan, and another (*R. Houlstonii* Hemsl. & Wils.) is very close of kin to *R. Fortunei* Lindl. of eastern China. *R. Augustinii* Hemsl. grows also in western Szechuan where it is rather rare and so, too, does *R. pittosporaefolium* Hemsl. which has also been found in Hunan province. Quite recently *R. Wilsonae* Hemsl. & Wils. has been found on the mountains of northern Kwangtung. Of the remaining six species, three (*R. ovatum* Planch., *R. Mariesii* Hemsl. & Wils. and *R. molle* G. Don) have their headquarters in eastern China and their western limits of distribution in Hupeh. One (*R. micranthum* Turcz.) is a wide-spread species in north China, Manchuria and Korea which has its southern limits in Hupeh; another (*R. yanthinum* Bur. & Franch.) is a western species with its eastern limits in Hupeh. The remaining species (*R. Simsii* Planch.) is universally distributed through all the warm temperate parts of China.

The first of the endemic species was discovered about 1886 by A. Henry who altogether brought five new species to our knowledge though one was not recognized until 1910. Père P. Farges in the neighborhood of Tchen-keou-ting discovered between 1891 and 1894 six new species. In 1900 I added *R. Wilsonae* Hemsl. & Wils. to the list. One species (*R. Augustinii* Hemsl.) was first introduced into cultivation by Père P. Farges who sent seeds to M. Maurice de Vilmorin in 1899. With the exception of *R. detersile* Franch. all the other species of the region were introduced into cultivation (twelve for the first time) by myself during 1900, 1901 and 1907 through seeds sent to Messrs. Veitch and to the Arnold Arboretum; also the stock of *R. Augustinii* Hemsl. in British and American gardens is from seeds collected by me. All the introduced species have flowered in Britain where they have proved as hardy as the rank and file of evergreen Rhododendrons, but in the Arnold Arboretum only one (*R. micranthum* Turcz.) will grow out-of-doors. Though comparatively few in number these Hupeh species are an important unit; several are in the front rank of the genus. The blue-flowered form of *R. Augustinii* Hemsl. is one of the most remarkable of Rhododendron and *R. auriculatum* Hemsl. is unique as the last of its race to open its flowers in summer. Late-flowering and beautiful is *R. discolor* Franch. and *R. Fargesii* Franch. is of its class one of the loveliest.

KEY TO THE SUBGENERA

Shrubs or trees with persistent, rarely deciduous, glabrous, lepidote or tomentose leaves; stamens 5–20; ovary glabrous, lepidote or tomentose, never setose, sometimes more than 5-celled; corolla 5, 7 or 9-lobed; flowers terminal, rarely terminal and lateral....................................I. *Eurhododendron.*

Shrubs with persistent or deciduous, non-lepidote leaves; ovary glabrous or tomentose, never setose or lepidote; corolla rotate, subrotate or funnelform-campanulate; stamens 5 or 10; flowers lateral, solitary or in fascicles of 2 or more.
II. *Azaleastrum.*

Shrubs or small trees with deciduous, or persistent, strigose or villose, sometimes glabrous but never lepidote leaves; corolla funnelform to rotate, rarely campanulate; stamens 5–10; ovary usually strigose, rarely glabrous, never lepidote; flowers terminal....................................III. *Anthodendron.*

SUBGEN. I. EURHODODENDRON ENDL.

Rhododendron subgen. **Eurhododendron** Endlicher, Gen. Pl. 759 (1839), emended.

Rhododendron sect. I. *Ponticum* G. Don, Gen. Syst. III. 843 (1834), including sections II, III and IV.

Rhododendron sect. III. *Eurhododendron* De Candolle, Prodr. VII. 721 (1839), including sections I, II and IV.

KEY TO THE SECTIONS

Leaves persistent, glabrous or tomentose beneath, never lepidote; ovary glabrous, glandular or tomentose, never scaly; stamens 10 to 20; flowers several from a terminal bud..1. *Leiorhodium.*

Leaves persistent, more or less clothed with lepidote glands; corolla rotate, campanulate or funnelform; stamens 10; ovary lepidote; flowers several from a terminal bud, rarely from terminal and lateral clustered buds...2. *Lepipherum.*

SECT. 1. **Leiorhodium** REHD.

Rhododendron sect. **Leiorhodium** Rehder in Bailey, Stand. Cycl. Hort. v. 2937 (1916).

Rhododendron sect. *Eurhododendron* Maximowicz in Mém. Acad. Sci. St. Pétersb. sér. 7, XVI. no. 9, 14 (Rhod. As. Or.) (1870).—Not Endlicher.

KEY TO THE SPECIES

Corolla 5-lobed.
  Leaves green on both surfaces.
    Leaves glabrous, except midrib below.
      Calyx annular, glabrous...........................1. *R. sutchuenense.*
      Calyx saucer-shape, villose.........................2. *R. maculiferum.*
    Leaves densely clothed with rufous, floccose tomentum on the under surface.
3. *R. detersile.*
  Leaves pale gray or dun-colored on under surface.
    Indumentum uniform, firm, crustaceous; calyx annular with 5 minute, erect teeth...4. *R. hypoglaucum.*
    Indumentum not uniform, floccose and crustaceous; calyx membranous with 5 prominent reflexed lobes.......................5. *R. adenopodum.*
Corolla 7-lobed.
  Leaves glabrous; petiole purplish, glabrous.
    Calyx annular, obscurely toothed; pedicels glandular.
      Flowers umbellate...............................6. *R. Fargesii.*
      Flowers racemose...............................7. *R. Houlstonii.*
    Calyx saucer-shape, membranous with undulate teeth; pedicels not glandular or very rarely so..................................8. *R. discolor.*
  Leaves hairy; petiole bearded, glandular..................9. *R. auriculatum.*

Rhododendron sutchuenense Franchet in Jour. de Bot. IX. 392 (1895).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 112.—Hemsley in Bot. Mag. CXXXVI. t. 8362 (1911).—Schneider, Ill. Handb. Laubholzk. II. 1045, fig. 615, f–g (1912).—Rehder & Wilson in Sargent, Pl. Wilson. I. 544 (1913).—Bean, Trees & Shrubs Brit. Isles, II. 382 (1914).—Rehder in Bailey, Stand. Cycl. Hort. V. 2940 (1916).—P. D. Williams in Rhod. Soc. Not. I. 39 (1916).—Millais, Rhodod. 249, t. facing p. 16 (1917).—McDouall in Gard. Chron. ser. 3, LXVII. 172 (1920); LXXI. 227, fig. 118 (1922).—Mottet in Rev. Hort. 1922, 150, fig. 50, t.—S. W. P. in Garden, LXXXVII. 159, fig. (1923).—Osborn in Gard. Chron. ser. 3, LXXIII. 171, fig. 78 (1923); in Garden, LXXXVII. 523, fig. (1923).

> *Rhododendron praevernum* Hutchinson in Gard. Chron. ser. 3, LXVII. 127 (1920).—Garden, LXXXIV. 115, fig. (1920).—Armytage Moore in Rhod. Soc. Not. II. 77 (1922).—Osborn in Gard. Chron. ser. 3, LXXIII. 159, fig. 74 (1923); in Garden, LXXXVII. 521, fig. (1923).

Bush from 3 to 8 m. tall with many stout, ascending-spreading branches clothed when young with a gray scurf; winterbuds stout, subglobose to broadly ovoid, glabrous. Leaves tufted, coriaceous, oblong-oblanceolate, without petiole 10–25 cm. long, 3–7.5 cm. wide, rounded, apiculate, base cuneate, upper surface dark green, lower pale green, glabrous except the midrib on lower surface which is clad more or less densely with pale gray, floccose tomentum; petiole stout, flattened, 1–3 cm. long, often slightly winged. Flowers from 10 to 20 in a terminal, dense, umbellate raceme; rhachis 1–2.5 cm. long, pedicels stout, ascending-spreading, 1–2.5 cm. long, glabrous; calyx oblique, annular, minutely toothed, glabrous; corolla 5-lobed, pink to rosy lilac, campanulate, 5–7.5 cm. deep, 6–8 cm. wide, lower part of tube pubescent within blotched or spotted with dark red-purple on the posterior part, lobes broad, spreading, rounded, emarginate; stamens 14–18, of unequal length, shorter than corolla, filaments flattened, lower third puberulous, anthers oval, very dark; pistil glabrous, overtopping stamens but shorter than corolla, ovary ovoid, style stout, thickened upward, slightly curved; stigma red, capitate. Fruit brownish purple, oblique, oblong, 3–4 cm. long, 1–1.5 cm. wide, furrowed; seed shining brown, flattened, oblong, 5 mm. long, with prominent wing.

This is the most arborescent of the Hupeh species and is well distinguished by its stout branches, its large leaves, glabrous except the midrib on the lower surface, its many-flowered umbellate inflorescence and by its bell-shaped, 5-lobed corolla. It is a noble Rhododendron, wide-spread in western Hupeh and eastern Szechuan and common between elevations of from 4500 to 7600 ft. It is always found in mixed woods often growing under the shade of evergreen Oaks and among *Arundinaria nitida* Mitford and other thin-stemmed Bamboos. In fact it shares with *R. auriculatum* Hemsl. a greater love for shade than other Hupeh Rhododendrons. The leaves are tufted at the end of the branches, large, dark green often attenuate at the base and though the habit of growth is splendid the plants look best when seen from above. The flowers are large, very numerous and crowded into a dense rounded truss, the color varies from pale to rose-pink and rosy lilac and the interior of the corolla may be spotted or blotched with maroon or red-purple. At the lowest altitudinal level at which it grows wild the flowers open early in April before the snow has finally disappeared. Higher up on the mountains the flowering is delayed until May but this species is the earliest of its class to open its flowers. This was the first Rhododendron I saw in Hupeh and it was in bloom on April 9, 1900.

Rhododendron sutchuenense was discovered by A. Henry in 1888 but was named from specimens gathered by Père P. Farges round Tchen-keou-ting between 1891 and 1894. It was introduced into cultivation by seeds (No. 517) collected by me in the autumn of 1900 and again (No. 1232) in that of 1901; these were sent to Messrs. Veitch. In 1907, I sent a large supply of seeds (No. 509) to the Arnold Arboretum and these were widely distributed. This Rhododendron flowered first in the Coombe Wood nursery in 1910 when the plants were quite small. It has now flowered freely in many gardens and has proved hardy in Great Britain.

Among the many plants that have flowered slight variation in the shape of the leaf-base, in degree of pubescence on the midrib, in the color of flowers and in the degree of spotting within the corolla-tube have been observed. Such individual differences must be expected when a species is raised in large quantities from seeds. For garden purposes it is convenient to distinguish such forms but it is well to remember that they have horticultural rather than botanical significance. In establishing this species Franchet did not mention the color of the flowers, that figured in the *Botanical Magazine* without a blotch in the corolla-tube may serve as the type though, as a matter of fact, in a wild state this is less common than the form with a wine-colored blotch which has been distinguished as:—

Rhododendron sutchuenense var. **Geraldii** Hutchinson in Gard. Chron. ser. 3, LXVII. 128 (1920).

The *R. praevernum* Hutchinson belongs here though its author would have us regard it as a distinct species on account of its glabrous midrib, narrow leaf-base and flowers of a slightly different color. These differences are in themselves trivial and, moreover, inconstant.

According to Millais (*Rhodod.* 250) this species has been crossed with several Garden Rhododendrons at Caerhays Castle. No doubt this has been done in many other gardens, and there is a hybrid of this species with Rhododendron "Cornubia" named:—

Rhododendron cornsutch Magor in Rhod. Soc. Not. II. 120 (1922).

Rhododendron maculiferum Franchet in Jour. de Bot. IX. 393 (1895).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 107.—Rehder & Wilson in Sargent, Pl. Wilson. I. 531 (1913).—Millais, Rhodod. 205, fig. facing p. 24 (1917).

Bush from 1–7 m. tall (usually from 3 to 5 m.), wide-branching, the branches moderately stout, with or without a gray scurfy covering when young; winter-buds ovoid with glandular, ciliolate scales. Leaves coriaceous, glabrous, elliptic to oblong, sometimes broadest above the middle, without petiole 5–12 cm. long, 2.5–5.5 cm. wide, rounded, apiculate, base rounded or slightly subcordate, rarely oblique, upper surface dark green, lower pale green, midrib stout, prominent and clothed with floccose gray tomentum on lower surface; petiole stout, 1–2.5 cm. long, glabrescent. Flowers 6–12 in a terminal umbellate raceme; rhachis 1.5–3.5 cm. long and with pedicels densely clothed with rufous-gray villose hairs; pedicels ascending-spreading, 1–2.5 cm. long; calyx villose, saucer-shaped, with 5 small, unequal triangular teeth; corolla 5-lobed, white or pale pink with posterior blotch or spots of maroon near base, campanulate, 2.5–4.5 cm. deep and broad, lobes short, spreading, rounded, often emarginate; stamens 10, of unequal length, shorter than corolla, filaments flattened, slightly villose at base, anthers oval, very dark; pistil as long as corolla, ovary narrow-ovoid, clothed with rufous-gray villose pubescence, style reddish, filiform, stigma capitate.

This species is distinguished by the shape of its ample leaves, the midrib on the under surface broad and covered with floccose hairs, and by its villose rhachis, pedicel and ovary. The bell-shaped flowers are arranged in compact rounded trusses which terminate every shoot. It is a woodland plant, wide-spread and common between elevations of from 5000 to 10000 ft. throughout western Hupeh and contiguous Szechuan. It is most abundant in forests of *Abies Fargesii* Franch. associated with *Arundinaria Murielae* Gamble, above 8000 ft. altitude in Fang district. It is indeed a high-level species and with *R. Fargesii* Franch. is found at greater altitudes than any other Rhododendron in Hupeh. In a wild state it is in flower from mid-May until mid-June. Usually it is a bush from 8 to 15 ft. tall and broad but I once saw it 30 ft. high with a trunk 2 ft. in girth being quite tree-like in appearance.

This Rhododendron was discovered round Tchen-keou-ting by Père P. Farges sometime between 1891 and 1894; it was introduced into cultivation by seeds (No. 944) which I collected in the district of Changyang in December, 1900, and sent to Messrs. Veitch. All the plants in cultivation are of this origin. It flowered for the first time in gardens at Caerhays Castle. In Cornwall it flowers in late March and early April but in colder districts it will be found to blossom later. It is a hardy, sturdy species of good habit and abundant foliage. Though not one of the finest it is a very floriferous Rhododendron possessed of much quiet charm.

Rhododendron detersile Franchet in Jour. de Bot. XII. 260 (1898).—Millais, Rhodod. 154 (1917).

Bush about 1 m. tall, much branched, the branches clothed with rufous, floccose tomentum, when young, soon glabrous. Leaves lanceolate, without petiole 4–6 cm. long, base truncate, apex obtuse with thickened mucro, margins revolute, upper surface smooth, lower clad with rufous floccose tomentum; petiole 0.3–0.4 cm. long, woolly. Flowers from 4 to 8 in a terminal cluster, pedicels 1.2–1.8 cm. long, clothed with pilose woolly hairs, calyx membranous, yellowish, lobes ovate-lanceolate, 0.3–0.4 cm. long, acute; corolla 5-lobed, pink, campanulate, about 3 cm. long, pubescent within on lower part, elsewhere glabrous; stamens 10, included, filaments pilose below; ovary glandular-pilose, style clad with long hairs near base. Fruit 1.2 cm. long, clothed with glandular and rufous pubescence.

This species was discovered near Touan-tchen in the district of Taning Hsien at an altitude of 2500 m. by Père P. Farges. Franchet states that it belongs to the same group as *R. Edgeworthii* Hook. f. and is distinguished by the smooth upper surface of the small leaves, by its rufous floccose tomentum which soon disappears and by the shape of its well-developed calyx. It is not in cultivation and is quite unknown to me.

Rhododendron hypoglaucum Hemsley in Jour. Linn. Soc. XXVI. 25 (1889).—Diels in Bot. Jahrb. XXIX. 512 (1910).—Bean in Flora & Sylva, III. 164 (1905); Trees & Shrubs Brit. Isles, II. 361 (1914).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 111.—Pampanini in Nuov. Giorn. Bot. Ital. n. ser. XVII. 683 (1910).—Rehder & Wilson in Sargent, Pl. Wilson. I. 527 (1913).—Hutchinson in Bot. Mag. CXLII. t. 8649 (1916).—Millais, Rhodod. 188 (1917).

Rhododendron gracilipes Franchet in Jour. de Bot. IX. 391 (1895).—Hutchinson in Millais, Rhodod. 174 (1917).

Rhododendron chionophyllum Diels in Bot. Jahrb. XXIX. 512 (1900).—Hutchinson in Millais, Rhodod. 143 (1917).

Bush from 1.5 to 5 m. tall with the first year branches bright green, later pale gray; winterbuds elongate, acute, glabrous, the bud-scales finely ciliolate. Leaves coriaceous, rigid, oblong-elliptic to oblong-oblanceolate, without petiole, 5–12 cm. long, 2–4.5 cm. wide, acute, mucronate, base narrowed often cuneate, upper surface lustrous green with impressed midrib, lower completely covered with a white crustaceous indumentum; petiole stout, 1.5–2.5 cm. long, glabrous. Flowers 4 to 10 or more in an umbellate raceme; rhachis 1–2.5 cm. long; pedicels slender, 1–3.5 cm. long, pubescent and slightly glandular or glabrous; calyx minute, 5-toothed, glabrous or sparsely glandular pubescent, teeth often glandular-ciliolate; corolla 5-lobed, pink or white, funnelform, 3–4.5 cm. long, 3.5–5 cm. wide, the posterior part spotted with rose-color, sometimes sparsely pubescent near base within, lobes rounded; stamens usually 10, of unequal length, shorter than the corolla, filaments slightly pubescent near base, anthers rose-color; pistil slightly exserted, ovary narrow-ovoid, furrowed, glabrous or puberulous and glandular, style filiform, glabrous, stigma capitate, lobed. Fruit oblong-cylindric, 1–1.5 cm. long, 0.3–0.4 cm. wide, curved, furrowed, slightly verruculose; seed dark brown, 1–2 mm. long, oval, slightly compressed, wing minute.

This is well-distinguished from other Hupeh species by the white crustaceous covering on the under surface of the leaves. It is a very common species in western Hupeh between 4500 and 7000 ft. altitude and it grows in eastern Szechuan where it was found by Père P. Farges round Tchen-keou-ting in the northeast and by A. von Rosthorn near Nan-ch'uan Hsien in the southeast. Though it skirts it does not cross the Red Basin but is represented in western Szechuan by the closely related *R. argyrophyllum* Franchet. In many places *R. hypoglaucum* is very abundant, scattered through thin woods or at its altitudinal limits growing in open country among rocks. It is a much-branched plant of good habit sometimes 20 ft. tall and as much in diameter and is very floriferous with rather small flowers in a compact truss. Both white and pink-flowered forms grow wild being in fact equally common. The flowers open in May, are broader than deep and the corolla is narrowed abruptly to the base. The ovary and flower-stalks vary from glabrous to pubescent and glandular and the latter vary considerably in length.

This Rhododendron was first discovered in 1886 by A. Henry in the district of Patung and introduced into cultivation by seeds (No. 752) which I sent to Messrs. Veitch in the autumn of 1900. It first flowered under cultivation at Caerhays Castle in May, 1915, and was figured in the Botanical Magazine though the drawing is not very accurate. In a wild state the plants bloom from near the end of April until the end of May according to altitude.

The color of Hemsley's type is not given but for convenience's sake the form with white flowers may be distinguished as:—

Rhododendron hypoglaucum f. **album** Wilson, n. forma.

Rhododendron adenopodum Franchet in Jour. de Bot. IX. 391 (1895).—Bean in Gard. Chron. ser. 3, XLV. 291, fig. 125 (1909); in Kew Bull. Misc. Inform. 1914, 382; Trees & Shrubs Brit. Isles, II. 340 (1914).—Millais, Rhodod. 110 (1917).—J. C. Williams in Rhod. Soc. Not. I. 132 (1917).—Balfour f. in Rhod. Soc. Not. I. 148 (1917).

Bush from 1 to 4 m. tall with branches the first year more or less sparsely clothed with pale gray appressed tomentum through which are scattered glistening lepidote glands; winterbuds viscid, the lower bud-scales lanceolate and woolly. Leaves oblong-oblanceolate to oblong, without petiole 8–20 cm. long, 2–5 cm. wide, apex acute and mucronate; base usually narrowed, glabrous, shining green above, under surface densely covered with close, felted, gray to dun-colored tomentum; petiole stout, 1.5–2.5 cm. long, floccose, often glandular. Flowers 6 to 10 or more in an umbellate raceme; rhachis 2–3.5 cm. long; pedicels 2–4 cm. long, erect-spreading, densely stipitately glandular; calyx membranous, persistent, reflexed, lobes lanceolate to ovate, about 5 mm. long, acute vilose and glandular without; corolla 5-lobed, pink, broad-funnelform, 4–6.5 cm. long and broad, the posterior part within spotted with maroon, slightly villose near base, lobes rounded; stamens 10, of unequal length, shorter than corolla, filaments flattened, villose in lower part, anthers pale; pistil as long or nearly as long as the corolla, ovary ovoid, densely hispid, glandular, style curved, glabrous, stigma capitate, lobed. Fruit oblong-cylindric, 1.5 cm. long, 0.7 cm. wide, terete, setose, glandular; seed dark brown, narrow-ovoid, 1.5–2 mm. long, angular, acute, wing minute.

This species is easily recognized by the floccose gray to dun-colored tomentum on the under surface of the leaves, by its villose and glandular pedicels, its membranous reflexed calyx and by its oblong-cylindric hispid and glandular fruit. It was discovered in the neighborhood of Tchen-keou-ting, a district in the extreme northeastern Szechuan, by Père P. Farges. In Hupeh this Rhododendron is quite rare and is not known to grow south of the Yangtsze River. It is only known to me from two or three localities in the Hsing-shan district where it grows in thin woods among rocks between 5000 and 7000 ft. altitude. I first found it in flower in mid-May, 1900, and gathered herbarium specimens (No. 1161); in October of the same year I collected seeds (No. 505) and sent them to Messrs. Veitch. This was the first introduction of this Rhododendron into Europe and the plants in English gardens are all from this source. In 1901 Père Farges sent seeds to M. Maurice de Vilmorin at Les Barres where a plant grown in a pot in an unheated greenhouse flowered in 1909 for the first time in cultivation. Since then this Rhododendron has flowered at Caerhays, at Kew, and elsewhere. In a wild state this species blossoms during late April and May at the first burst of spring and not infrequently its flowers suffer from late frosts. The habit of this plant is somewhat ungainly, being tall and rather sparingly branched; the flower truss is loose and the color of the corolla varies from pale to rose-pink. The lustrous green upper surface and the gray under surface of the leaves form a pleasing contrast. It is very distinct from other Rhododendrons of central China and amongst the older and better known species reminds one of *R. Smirnovii* Trautv. native of the Caucasus Mountains.

Rhododendron Fargesii Franchet in Jour. de Bot. IX. 390 (1895).—Bois in Jour. Soc. Hort. France, ser. 4, I. 217, fig. 24 (1900).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 109.—Watson in Gard. Chron. ser. 3, LI. 252 (1912).—Raffill in Gard. Chron. ser. 3, LII. 4, fig. 4 (1912).—Rehder & Wilson in Sargent, Pl. Wilson. I. 540 (1913).—Bean, Trees & Shrubs Brit. Isles, II. 354 (1914); in Gard. Chron. ser. 3, LXXI. 239, fig. 125 (1922).—Hutchinson in Bot. Mag. CXLIII. t. 8736 (1917).—Millais, Rhodod. 162, fig. facing p. 246 (1917), excluding reference to Forrest's Yunnan plant.—Garden, LXXXIV. 403, fig. (1920).—Magor in Gard. Chron. ser. 3, LXXI. 42, fig. 21 (1922).

Bush from 1 to 6 m. tall with many moderately thick, glabrous branches, often bloomy purple the first year; winterbuds ovoid to subglobose, glabrous. Leaves tufted, coriaceous, glabrous, elliptic to oblong-elliptic, without petiole 3–10 cm. long, 1.5–4.5 cm. wide, rounded, mucronate, base abruptly rounded, truncate or sub-cordate, upper surface dark green, lower pallid; petiole purplish, 1–3 cm. long. Flowers 6–12 in a terminal umbellate cluster; pedicel 1–2.5 cm. long, stipitate-glandular; calyx annular, obscurely lobed, glandular; corolla 7-lobed, pink to rose-red, sometimes white, spotted with rose-red on posterior segment, wide-funnelform, 3–6 cm. deep, 4–7 cm. wide, lobes short, rounded, spreading; stamens about 14, of unequal length, shorter than corolla, filaments glabrous, anthers dark, oval; pistil nearly as long as corolla, ovary ovoid, glandular, style reddish, curved, glabrous, stigma capitate, lobed.

This beautiful species is easily recognized among other Hupeh Rhododendrons by the shape and relatively small size of its leaves, by its compact umbellate inflorescence and by its glandular pedicels and ovary. It grows wild on the high mountains of northwestern Hupeh and contiguous Szechuan and is not known to grow elsewhere, for the statement by Millais that Forrest found this species in Yunnan is erroneous. Père Farges reports it from a calcareous region but I never saw it growing either in or on limestone. Its altitudinal range is from 6500 to 9500 ft. though it is most plentiful round about elevations of 8000 ft. At the lowest level of its distribution this plant grows in mixed woods, higher up it is common in forests of *Abies Fargesii* Franch., *Pinus Armandi* Franch. and *Picea Wilsonii* Mast., *Populus tremula* var. *Davidiana* Schneid., *Betula albo-sinensis* Burkill and other trees. Above the level of forests it is abundant among shrubs and on the fully exposed slopes and mountain tops often forms extensive thickets. It is usually a bush from 6 to 10 ft. high and broad but often it is double these dimensions. The habit is good though the foliage is rather sparse and being small exposes clearly the polished branches. The flowers vary in color from pale-pink to rose-red, occasionally they are white and more or less dotted with rose-color. The plant is exceedingly floriferous, every shoot terminating in a dense rounded truss of flowers. So abundantly does it blossom that the bushes frequently exhaust themselves and die. The flowers open from the middle of May until the beginning of June often while snow still lays in shaded places.

This Rhododendron was discovered between 1891 and 1894 by Père P. Farges near the village of San-ken-cheou in the district of Taning in eastern Szechuan. It was found by me in Fang district in western Hupeh and introduced into cultivation by means of seeds (No. 1250) sent to Messrs. Veitch in the autumn of 1901. All the plants in gardens are from this source. It first flowered in Cornwall at Caerhays Castle in March, 1911, and about the same time in the garden of Mr. P. D. Williams at Lanarth.

Though not so valuable to gardens as the late-flowering *R. auriculatum* Hemsl. or *R. discolor* Franch. this Rhododendron is my favorite among the Hupeh species. Its foliage and habit of growth, exuberance of blossoms, compact trusses and the cheery color of its flowers are pleasing qualities dear to me. It won my affection the first time I saw it capping a windwept ridge in May, 1901 and has held it ever since.

According to Millais this species has been crossed at Leonardslea with a blood-red form of *R. arboreum* Smith.

The form with white flowers spotted with rose-red may be distinguished as:—

Rhododendron Fargesii f. album Wilson, n. forma.

Rhododendron Houlstonii Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 110.—Bean, Trees & Shrubs Brit. Isles, II. 361 (1914); in Rhod. Soc. Not. I. 189 (1918).—Magor in Rhod. Soc. Not. II. 120 (1922).

Rhododendron Fortunei var. *Houlstonii* Rehder & Wilson in Sargent, Pl. Wilson. I. 541 (1913).—Millais, Rhodod. 169 (1917).

Bush from 2 to 4 m. tall, wide-branching, with many moderately stout stems, glabrous, often reddish and bloomy the first year; winter-buds ovoid, glabrous or puberulous. Leaves coriaceous, glabrous, oblong-oblanceolate to elliptic-oblong, without petiole 7.5–15 cm. long, 2.5–4 cm. wide, rounded, short apiculate, base rounded or cuneate, sometimes oblique, dark green above, under surface pallid; petiole purplish, 1.5–2.5 cm. long. Flowers from 6 to 10 or more in a terminal umbellate raceme; rhachis 2–6 cm. long, glabrous; pedicel ascending-spreading, 2–4 cm. long, sparsely and densely glandular often stipitately so; calyx oblique, annular, minutely toothed, sparsely glandular; corolla 7-lobed, oblique in bud, pink, wide-funnelform, 4–6 cm. deep, 5–8 cm. wide, often with a few faint lines of mixed green and dull crimson on the posterior part, lobes erect-spreading, rounded or truncate; stamens 14, unequal in length, shorter than corolla, filaments pale, flattened, quite glabrous, anthers oval; pistil over-topping stamens, as long or nearly as long as the corolla, glandular, ovary ovoid, style greenish, stout, curved in upper part, stigma capitate. Fruit bloomy purple, oblong, 2.5–3 cm. long, 0.8 cm. wide, furrowed, smooth or glandular; seed shining pale brown, flattened, oblong, 0.4–0.6 cm. long, surrounded by a prominent wing.

A very beautiful species distinguished by its foliage, by its glandular pedicels, its nearly obsolete calyx and by its wide-funnelform nearly bell-shaped corolla with relatively short ascending-spreading lobes. It is a critical species closely related to *R. Fortunei* Lindl. and to *R. discolor* Franch. but flowers three weeks earlier than the former and six weeks earlier than the latter. Though nowhere common it is widespread in Hupeh and eastern Szechuan growing in mixed woods at elevation of from 4600 to 7000 ft. It is usually a shrub from 6 to 10 ft. tall and broad and I have not seen plants exceeding dimensions of 15 ft. The habit is compact and fairly dense and the trusses of flowers are borne well above the foliage. In color the flowers are most pleasing shades of pink and the marking when present is inconspicuous. The glands on the pedicels and pistil may be sessile or stalked or both, and very numerous or sparse. The rank this plant is entitled to has puzzled me greatly but on the whole in the present state of our knowledge I think it is best considered as a distinct species. In habit of growth, in foliage and in form of inflorescence and in the color of its flowers I regard this as one of the prettiest of the Hupeh species. In a wild state the blossoms open in late April or early May and there is a danger in gardens of its flowers being injured by late frosts. It is essentially a woodland species where rock and abundant humus prevail. This Rhododendron was discovered by A. Henry on the borders of Changyang and Patung districts in 1888; it was introduced into cultivation by means of seeds (Nos. 648, 648a) which I collected in the Hsingshan district and sent to Messrs. Veitch in October, 1900. Plants flowered for the first time in cultivation in 1913 in Coombe Wood nursery.

Rhododendron discolor Franchet in Jour. de Bot. IX. 391 (1895).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 112.—Rehder & Wilson in Sargent, Pl. Wilson. I. 542 (1913).—Bean in Kew Bull. Misc. Inform. 1914, 383; Trees & Shrubs Brit. Isles, II. 353 (1914); in Rhod. Soc. Not. I. 190 (1918).—Millais, Rhodod. 155 (1917).—Hutchinson in Bot. Mag. CXLIII. t. 8696 (1917).—Chenault in Rev. Hort. 1918, 148, fig. 48–49.—Garden, LXXXIII. 503, fig. (1919); LXXXIV. 270, fig. (1920).—Dillistone in Garden, LXXXV. 346, fig. (1921).—Osborn in Gard. Chron. ser. 3, LXXII. 19, fig. 10 (1922).

Rhododendron mandarinorum Diels in Bot. Jahrb. XXIX. 510 (1900).—Hutchinson in Millais, Rhodod. 206 (1917).

Rhododendron Kirkii Hort. Veitch apud Millais, Rhodod. 169 (1917).—Bean in Rhod. Soc. Not. I. 190 (1918).—Armytage Moore in Rhod. Soc. Not. II. 76 (1922).

Rhododendron Fortunei var. *Kirkii* Millais, Rhodod. 169 (1917).

Bush 2–6 m. tall with stout shoots, glabrous, often bloomy the first year; winterbuds ovoid with ciliolate bud-scales. Leaves coriaceous, glabrous, oblong-elliptic, 10–25 cm. long, 2.5–7.5 cm. wide, obtuse, mucronate, base narrowed, often sub-auriculate, rarely truncate, upper surface dark rich green, under surface pallid; petiole stout, 2–3.5 cm. long, purple, often bloomy. Flowers fragrant, from 6 to 12 in a terminal umbellate raceme, rhachis 2–5 cm. long, glabrous, pedicel stout, ascending-spreading 1.5–4 cm. long, glabrous, occasionally glandular; calyx small, discoid, membranous, with gland-tipped undulate or triangular teeth; corolla deeply 7-lobed, white, pink or pink shading to white, wide-funnelform, from 6–10 cm. deep, 8–12 cm. wide, yellowish green within tube, lobes undulate, wide-spreading, rounded, emarginate or entire; stamens about 14, sub-equal in length, slightly exserted, much shorter than corolla, filaments flattened, glabrous, anthers pale yellow-brown, pistil much overtopping stamens; ovary ovoid, and with stout nearly straight style densely glandular; stigma large, capitate. Fruit woody, bloomy, oblique, purple, oblong, 3.5–5 cm. long, 1–2 cm. wide, furrowed, subtended by the persistent calyx, seeds shining brown, oblong, flattened, 4–6 mm. long, immersed in a broad wing.

This common species in Hupeh is well distinguished from others by being everywhere glabrous, by its small, membranous, undulate persistent calyx and by its gland-dotted pistil. It is plentiful in the woodlands between elevations of from 4500 to 7000 ft. everywhere in western Hupeh and eastern Szechuan to the edge of the Red Basin. A robust plant of good habit it is usually a bush from 10 to 12 ft. high and as much or more in diameter but often these dimensions reach 20 ft. The foliage is bold and leathery and the contrast between the purple petioles, the dark green upper surface and pallid under surface of the leaves is pleasing. The flowers are large, usually more or less pink in the bud and becoming pure white when fully exposed, fragrant and compacted into a fine rounded truss. It opens its flowers and commences to grow late in June and on this account is of exceptional value, a fact fully appreciated by those who have this species growing in their gardens.

This Rhododendron was discovered in the neighborhood of Tchen-keou-ting by Père P. Farges between 1891 and 1894; it was introduced into gardens by means of seeds (Nos. 885, 855b) sent by me to Messrs. Veitch in the autumn of 1900. In 1907 I sent seeds to the Arnold Arboretum and these were distributed far and wide. It flowered for the first time in cultivation at Coombe Wood in June, 1911. In gardens this Rhododendron has proved very amenable, flowers in June and early July, and by many is considered one of the finest of the Chinese species.

In 1902, before I knew the identity of this Rhododendron I suggested to Messrs. Veitch that it be named "*R. Kirkii*" after my friend Dr. William Kirk, then of the Chinese Imperial Maritime Customs Service and stationed at Ichang. Later plants were distributed under this unpublished name and, unfortunately, a good deal of confusion has been quite innocently caused. The typical form has pale pink passing to pure white flowers. There is, however, a good pink form and this may be distinguished as:—

Rhododendron discolor f. carneum Wilson, n. forma.

There is a hybrid of *R. discolor* × *R. catawbiense* × ? which has been named:—

× **Rhododendron holmleaense** Rehder in Jour. Arnold Arb. III. 48 (1922).

This was raised in 1915 in the gardens of Professor Sargent, Holmlea, Brookline, Mass., where it flowered for the first time in 1921. It is a valuable hybrid but unfortunately precariously hardy in Massachusetts.

Another hybrid, the result of crossing the garden Rhododendron "Königin Carola" and *R. discolor* has been named:—

× **Rhododendron konigdis** Magor in Rhod. Soc. Not. II. 121 (1922).

The flowers are described as lilac-white, deeper in the bud, 8-lobed, open campanulate with a large blotch of crimson and spots of the same color on the upper segments. Another plant had flowers the lightest shade of heliotrope with the segments spotted at the base with olive-green.

Rhododendron discolor has been hybridized with other Rhododendrons in many gardens though I do not know if the progeny has received names. Bean (in Rhod. Soc. Not. I. 191 (1918)) says, "Several crosses with *discolor* as one parent have been made at Kew chiefly with such garden varieties as "Pink Pearl," "Strategist," "Doncaster," "Memoir," etc. But it has also been hybridized with some species as *R. Griffithianum* (*Aucklandii*), *R. maximum* and *R. occidentale*, the last of course an Azalea."

Rhododendron auriculatum Hemsley in Jour. Linn. Soc. XXVI. 20 (1889).—Veitch in Jour. Hort. Soc. Lond. XXVIII. 64, fig. 25 (1903).—Bean in Flora & Sylva, III. 163 (1903); in Kew Bull. Misc. Inform. 1914, 201; Trees & Shrubs Brit. Isles, II. 343 (1914); in Gard. Chron. ser. 3, LX. 110 (1916); in Rhod. Soc. Not. I. 192 (1918).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 108.—Rehder & Wilson in Sargent, Pl. Wilson. I. 544 (1913).—Rehder in Bailey, Stand. Cycl. Hort. V. 2945 (1916).—Millais, Rhodod. 125, fig. facing p. 124 (1917).—Hutchinson in Bot. Mag. CXLV. t. 8786 (1919).—Waterer in Garden, LXXXVI. 455, fig. (1922).—Osborn in Garden, LXXXVII. 539, fig. (1923).

Bush from 2 to 7 m. tall with stout ascending-spreading stipitate-glandular branches; winterbuds ovoid, acuminate or acute, bud-scales aristate or acuminate. Leaves coriaceous, oblong, without petiole 12–30 cm. long, 4–10 cm. wide, rounded and apiculate at apex, base rounded, auricled, dull dark green, glabrescent above, under surface pale green, clothed more or less densely with rusty brown tomentum; lateral veins spreading and ascending-spreading, petiole stout, bearded and glandular. Flowers fragrant, 8–15 in an umbellate raceme, rhachis 4–6 cm. long and with stout, 2.5–3.5 cm. long, ascending-spreading pedicels densely covered with pilose and villose gland-tipped hairs; calyx discoid with short, membranous glandular-pubescent lobes; corolla 7-lobed, white or rose-pink, funnelform, 8–10 cm. long, 6–9 cm. wide, sparsely pubescent without, posterior part of tube splashed with green and rose-color in lower half, lobes rounded, spreading; stamens slightly exserted, about 14, filaments glabrous, anthers pale brown; pistil overtopping stamens but shorter than corolla, ovary ovoid, 0.7 cm. long, glandular; style stout, green, glandular; stigma capitate. Fruit purple with glaucous bloom, oblique, oblong, 3.5 cm. long, 1 cm. wide, terete; seeds pale brown, flattened, 0.4–0.6 cm. long, immersed in a large wing.

This magnificent species is well characterized by the hairiness of its foliage and flower stalks, by the cordate base of its oblong leaves and by its large funnelform, 7-lobed corolla. It is one of the finest of all the Chinese

Rhododendrons and is unique in the lateness of opening its flowers and in commencing the season's growth. In a wild state this species opens its flowers in late July or early in August but under cultivation this is sometimes delayed even into September. On the young growth the lower part is furnished with crimson, very glandular scale-leaves which are a conspicuous and attractive feature. The leaves are large and handsome, being sometimes fully a foot long and five inches wide. The flowers each 3 to 4 inches long and nearly as wide are pleasantly fragrant.

The species grows mainly in copses and woods where deciduous Oaks predominate at elevations between 5000 and 7000 ft. but is nowhere common. I have seen specimens growing in districts as far apart as Changyang in the south and Fang in the north but only once, and that in 1900, did I collect it in flower and fruit. The plant is more plentiful scattered through the wooded country round the hamlet of Kuan Pao on the border of Patung and Changyang districts than elsewhere so far as my knowledge goes. This is the type locality and it was here that I gathered the seeds. It is an arborescent shrub of excellent habit being sometimes 20 ft. tall and even more through the crown though usually its dimensions are round about 12 ft. The plant everywhere favors cool situations where the soil is rich in humus and where it is sheltered from strong winds.

This fine Rhododendron was discovered in 1885 by A. Henry on the mountains round Kuan Pao; it was introduced into cultivation by myself in 1900 by means of seeds (No. 920) collected in November and sent to Messrs. Veitch. A large number of seedlings were raised of which one hundred were planted out in Coombe Wood nursery and later distributed among British gardens where there are now growing many fine specimens. The best plants in cultivation are those at Caerhays where it flowered for the first time in September, 1912. Since that date it has flowered in many gardens and is well-known and esteemed one of the grandest of all Rhododendrons. The late-flowering character is of great importance and in the hands of hybridizers may lead to the evolving of a race of late August and September flowering Rhododendrons. At Caerhays Castle it has been crossed with *R. decorum* Franch. and according to Millais (Rhodod. 125 [1917]) the plants in 1915, their third season, showed 70 per cent *R. auriculatum* in the cross. At Kew according to Bean (in Rhod. Soc. Not. I. 193 [1918]) this species has been crossed with *R. ponticum* Linn. Probably other attempts to hybridize it have been made and the results of these experiments will be watched for with great interest.

The form most usually seen wild and the only one that has flowered under cultivation has white flowers. There is, however, a wild form with rose-pink blossoms which may be distinguished as:—

Rhododendron auriculatum f. roseum Wilson, n. forma.

SECT. 2. LEPIPHERUM G. DON

Rhododendron sect. **Lepipherum** G. Don, Gen. Syst. III. 845 (1834).
Rhododendron sect. *Osmothamnus* Maximowicz in Mém. Acad. Sci. St. Pétersb. sér. 7, XVI. no. 9, 14 (Rhod. As. Or.) (1870), in part.

KEY TO THE SPECIES

Corolla funnelform-campanulate, filaments villose at base.
  Shoots villose, not verrucose when young; midrib pilose or villose on under surface of leaf....................10. *R. Augustinii.*
  Shoots not villose, densely verrucose when young; midrib glabrous on under surface of leaf....................11. *R. yanthinum.*
Corolla rotate-campanulate, filaments glabrous....................12. *R. micranthum.*

Rhododendron Augustinii Hemsley in Jour. Linn. Soc. XXVI. 19 (1899).—Vilmorin & Bois in Frut. Vilmorin. 173 (1904).—Bean in Flora & Sylva, III. 162, t. (1905); Trees & Shrubs Brit. Isles, II. 343 (1914).—Mottet in Rev. Hort. 1909, 18, fig. 6.—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 114.—Raffill in Gard. Chron. ser. 3, LII. 4, fig. 3 (1912).—Rehder & Wilson in Sargent, Pl. Wilson. I. 524 (1913).—Craib in Bot. Mag. CXXXIX. t. 8497 (1913).—Rehder in Bailey, Stand. Cycl. Hort. V. 2938 (1916).—Magor in Rhod. Soc. Not. I. 24 (1916).—Millais, Rhodod. 124, fig. facing p. 24 (1917).—Balfour f. in Rhod. Soc. Not. I. 148 (1917).—Garden, LXXXV. 68, fig. (1921).

Bush from 1 to 6 m. tall with many twiggy branches, reddish and villose when young, later glabrous with gray peeling bark; winter-buds narrow-ovoid, acute, pubescent and glandular-lepidote. Leaves subcoriaceous, lanceolate to oblong-lanceolate, without petiole 3–10 cm. long, 1–3 cm. wide, acute or subacuminate, base narrow, often abruptly so, sometimes rounded or truncate, upper surface dark green more or less covered with appressed gray hairs, lower surface gray-brown densely covered with shining brown lepidote glands, midrib pilose or villose on basal half; petiole 0.5–1.5 cm. long, villose. Flower usually 3 in a terminal fascicle, rarely 6; pedicels ascending-spreading, 1–2.5 cm. long; lepidote, pubescent or glabrous; calyx minute, discoid, lepidote with 5 small ciliolate teeth; corolla 5-lobed, pale to dark rose-purple, sometimes blue-purple, occasionally white, wide-funnelform, 3–4.5 cm. long and broad, blotched on posterior part with greenish yellow or yellow-brown, tube narrowed, lobes spreading, rounded or sub-acute, margin undulate, usually more or less lepidote-glandular without; stamens 10, unequal in length, slightly exserted, filaments villose at base; pistil overtopping stamens, ovary narrow-ovoid, 5 mm. long, densely lepidote with few pilose hairs at base and apex, style curved, glabrous, stigma capitate, lobed. Fruit oblong-cylindric, 1–2 cm. long, 0.3–0.4 cm. wide, deeply furrowed, lepidote, rarely sparingly pilose, seed pale brown, ovoid, acute, wingless.

This is an exceedingly common species in Hupeh and is found on the mountains westward far into Szechuan. It is partial to the margins of woods but is happiest in open rocky situations where it is fully exposed to the sun. In Hupeh it occurs between elevations of from 4000 to 7500 ft. and in northwestern Szechuan from 6000 to 9000 ft. Usually it is a much branched shrub of moderate size but frequently it is from 15 to 20 ft. tall and as much in diameter. The plants vary considerably in degree of hairiness but the pilose or villose midrib on the under surface of the leaf is a ready means of distinguishing *R. Augustinii* from all other related species. The fascicles are usually terminal and 3-flowered but on vigorous shoots often 6 flowers occur in each and lateral fascicles may also be present. The flowers vary in color from pale purple through deep rosy purple to lavender- and blue-purple, on some plants they are white. Some of the color forms, especially those bordering on blue, are very lovely. The species is very free-flowering and in a wild state blossoms during the month of May.

This Rhododendron was discovered in Patung district during 1886 by Augustine Henry whose Christian name it worthily bears. It was introduced into cultivation by Père P. Farges who, in 1899, sent seeds to M. Maurice de Vilmorin at Les Barres where a plant flowered for the first time in 1902. In 1900 from the Changyang district I sent seed (Nos. 517, 598) in quantity to Messrs. Veitch and in 1907 and 1908 from various localities in Hupeh and Szechuan to the Arnold Arboretum and all or nearly all the plants in British gardens are from these sources. This Rhododendron is now well established in many English gardens where it flowers freely each year and has won for itself a host of admirers.

In the most common color forms the flowers are shades of pale to rosy purple and this may be regarded as the type of the species.

The form with lavender- to blue-purple flowers may be distinguished as:—

Rhododendron Augustinii f. violascens Wilson, n. forma.

This Rhododendron is found mixed with the type throughout its distribution. Some fine forms have been raised from my seed No. 4238 collected in Wen-ch'uan district of northwest Szechuan in October, 1910. It is now well known in gardens where it is esteemed one of the loveliest of all.

A form with white flowers and less common than others is:—

Rhododendron Augustinii f. album Wilson, n. forma.

In the Rhodod. Soc. Not. II. 69 (1921) Magor tells of a hybrid between *R. oreostrephes* W. W. Smith × 4238 W. (*R. Augustinii* f. *violascens*). He describes the flowers as "five in a truss, palest light lilac (violet de cobalt) with a few spots of greenish brown on the upper segment, very broadly campanulate $1^3/_{10}$ × 2½ inches."

Rhododendron yanthinum Bureau & Franchet in Jour. de Bot. v. 94 (1891).—Rehder & Wilson in Sargent, Pl. Wilson. I. 518 (1913).—Bean, Trees & Shrubs Brit. Isles, II. 386 (1914).—Rehder in Bailey, Stand. Cycl. Hort. v. 2938 (1916).—Millais, Rhodod. 264 (1917).—Mottet in Rev. Hort. 1917, 348, t.

Rhododendron Benthamianum Hemsley in Kew Bull. Misc. Inform. 1907, 319; in Gard. Chron. ser. 3, XLVII. 4 (1910).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 115.—Millais, Rhodod. 128 (1917).

Rhododendron concinnum Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 115.—Not Hemsley.

Rhododendron atroviride Dunn in Jour. Linn. Soc. XXXIX. 484 (1911).

Bush from 1 to 4 m. tall with many thin but rigid branches which are densely verruculose the first year; winter-buds ovoid with lepidote bud-scales. Leaves coriaceous, elliptic-lanceolate to ovate-lanceolate, without petiole 2.5–7.5 cm. long, 1–4 cm. wide, acute, mucronate, base rounded or somewhat narrowed, dark green, lepidote, slightly rugulose above, under surface gray-green, densely covered with shining brown lepidote glands, midrib usually slightly pubescent on upper surface, glabrous on under surface; petiole 0.3–1 cm. long, lepidote. Flowers 4 to 10 in a terminal fascicle; pedicel 1–1.5 cm. long, lepidote; calyx discoid, lepidote, with 5 small acute teeth; corolla pale- to deep red-purple, rarely white, 5-lobed, wide-funnelform, 3–5 cm. long and broad, blotched on the posterior part with brown or greenish brown, more or less lepidote, rarely slightly pubescent without, tube narrowed, lobes wide-spreading; stamens 10, unequal in length, slightly exserted, filaments villose near base; pistil overtopping stamens, ovary ovoid, 0.3–0.5 cm. long, densely lepidote, style reddish, curved, glabrous, stigma capitate, lobed. Fruit slightly curved, oblong-cylindric, 1–1.5 cm. long, 0.3–0.4 cm. wide, densely lepidote-glandular; seed shining brown, ovoid, 1.5 mm. long, acute, wingless.

From the related *R. Augustinii* Hemsl. this Rhododendron is distinguished by its verrucose branchlets, its glabrous thicker, shorter and broader leaves, by the midrib not villose on under surface and by its many-flowered fascicles. It is an uncommon plant in Hupeh though it occurs on mountain cliffs between 5000 and 7000 ft. in Changyang district in the south and Fang in the north. Further north it has been collected in Shensi by W. Purdom who unfortunately gives no precise locality. However, *R. yanthinum* is really a western species which has its eastern limits of distribution in Hupeh. In western Szechuan it is abundant on the edge of woodlands and in thickets from Wa-shan and Mupin west to Tachien-lu between 5000 and 11000 ft. elevation. Usually it is a bush from 1.5–2.5 m. tall and about as much in diameter but sometimes it is double these dimensions. The branches though thin are rigid and numerous and the habit of the plant is compact. It flowers during May and June and at its altitudinal limits north of Tachien-lu I have gathered it in blossom as late as July 9.

This Rhododendron was discovered in the summer of 1890 in the neighborhood of Tachien-lu by Prince Henri d'Orleans; it was introduced into cultivation by seeds (No. 1433) collected by me on Wa-shan in October, 1903. The following year I sent more seeds to Messrs. Veitch and in 1908 and 1910 to the Arnold Arboretum. Plants raised by Messrs. Veitch flowered for the first time in May, 1907, at the Coombe Wood nursery.

The color of the flowers is not attractive and this species is the least desirable of the Rhododendrons of Hupeh.

The form with white flowers may be distinguished as:—

Rhododendron yanthinum f. **album** Wilson, n. forma.

The type of this form I gathered in Fang Hsien in May, 1907; I do not remember seeing a plant of the species with white flowers in western Szechuan though doubtless such do occur there.

Rhododendron micranthum Turczaninow in Bull. Soc. Nat. Moscou, x. no. 7, 155 (1837).—Wilson in Jour. Arnold Arb. iv. 42 (1923), where complete references and synonymy and a full account of the species are given.

Subgen. II. AZALEASTRUM Planch.

Rhododendron subgen. **Azaleastrum** Planchon in Rev. Hort. 1854, 43.—Maximowicz in Mém. Acad. Sci. St. Pétersb. sér. 7, xvi. no. 9, 15 (Rhod. As. Or.) (1870).—Rehder in Wilson & Rehder, Monog. Azal. 109, in text (1921).

Azaleastrum Rydberg in Mem. New York Bot. Gard. i. 297 (1900), as a genus.

KEY TO THE SECTIONS

Corolla rotate or subrotate; stamens 5; fruit sub-globose to broad ovoid. 1. *Euazaleastrum*.

Corolla funnelform to funnelform-campanulate; stamens 10; fruit spindle-form 2. *Choniastrum*.

Sect. 1. EUAZALEASTRUM Wils. n. sect.

Represented by..13. *R. ovatum*.

Rhododendron ovatum Planchon in Rev. Hort. 1854, 43.—Maximowicz in Mém. Acad. Sci. St. Pétersb. sér. 7, xvi. no. 9, 45 (Rhod. As. Or.) (1870).—Hemsley in Jour. Linn. Soc. xxvi. 28 (1889).—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 120.— Schneider, Ill. Handb. Laubholzk. ii. 509, fig. 333 k–l (1911).—Rehder & Wilson in Sargent, Pl. Wilson. i. 546 (1913).—Hayata, Icon. Pl. Formos. iii. 139 (1913).—Bean, Trees & Shrubs Brit. Isles, ii. 371 (1914).—P. D. Williams in Rhod. Soc. Not. i. 40 (1916).—Millais, Rhodod. 222, fig. facing p. 246 (1917).

Azalea ovata Lindley in Jour. Hort. Soc. Lond. i. 149 (1846).—Fortune in Jour. Hort. Soc. Lond. ii. 126, t. 2 (1847).—Hooker in Bot. Mag. lxxxiv. t. 5064 (1858).—Bentham, Fl. Hongk. 201 (1861).

Azalea myrtifolia Champion in Bot. Mag. lxxvii. sub. t. 4609 (1851).—Bentham in Hooker, Jour. Bot. Kew Gard. Misc. iv. 298 (1852).

Bush from 1 to 3 m. tall with many rigid, ascending-spreading, slender branches, glandular-setose when young. Leaves thinly coriaceous, violet-purple when young, dark lustrous green, glabrous at maturity, ovate, without petiole 2.5–5 cm. long, 1.5–2.5 cm. wide (rarely 6–7.5 cm. long, 3–5 cm. wide), short acuminate, emarginate, mucronate, base rounded or somewhat narrowed; midrib villose on upper surface; petiole 0.5–1 cm. long, villose when young. Flowers solitary, axillary, from buds near apex of previous season's growth; pedicels slender, 1–2.5 cm. long, densely clothed with short pilose-glandular hairs, at first sheathed in dry, pubescent bud-scales; calyx membranous, deeply 5-lobed, lobes oblong to broadly ovate, 0.4–0.6 cm. long, 0.2–0.4 cm. wide, sparsely glandular-ciliate; corolla deeply 5-lobed, pink to pale rosy-purple with a few darker colored dots on the posterior part, rotate, 2.5–3.5 cm. wide, lobes wide-spreading, rounded; stamens 5, filaments flattened, villose in lower half, pistil exserted, overtopping stamens, ovary subglobose, glandular, style slender, glabrous, stigma capitate, lobed. Fruit dark purple-brown, sub-globose, 0.5–0.6 cm. long and broad, glandular, partially enclosed within persistent, membranous calyx; seed minute, elongate, wingless.

This species is not uncommon between elevations of from 4000 to 7000 ft. in Hupeh but is not known to grow further west. It is distributed eastward to the shores of the Yellow Sea being found plentifully on the mountains of Kiangsu, Chekiang and Fokien provinces. It was originally known from the Chusan Islands but most probably only cultivated in the temple grounds of those sacred islands. On the mountains around Kuling it is particularly abundant round about 4000 ft. altitude. This Rhododendron also grows in Hongkong so Hupeh represents the northern as well as the western limits of its distribution.

It is a much branched, twiggy shrub seldom exceeding 8 ft. in height with rigid, ascending branches. The leaves are crowded at the ends of the branchlets and when young are a lovely violet-purple color. The flowers are flat of an undecided but pleasing shade of pink to pale rose-purple and open in May. In Hupeh it is partial to cliffs and rocky places where it grows mixed with other shrubs but is sheltered from strong winds.

This species was discovered on the Chusan Islands in the autumn of 1843 by Robert Fortune who sent seeds to the Horticultural Society of London the same year. Subsequently he found it wild on the mountains of the Chekiang province. Fortune tells of two forms, one with white and another with pink flowers. A white form is unknown to me in a living state.

Rhododendron ovatum was first found in Hupeh by A. Henry; in 1900 I sent seeds (No. 938) from the district of Changyang to Messrs. Veitch and in 1907 to the Arnold Arboretum from the same locality. Plants raised from my first consignment of seeds are thriving in Cornwall but have not proved very hardy in less favorable climates.

SECT. 2. CHONIASTRUM FRANCH.

Rhododendron sect. **Choniastrum** Franchet in Jour. de Bot. XII. 264 (1898), nomen.—Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 116.—Rehder & Wilson in Sargent, Pl. Wilson. I. 546 (1913), as sect. of Subgen. Azalea.

KEY TO THE SPECIES

Flowers in fascicles of 3 to several, stamens and pistil much longer than the corolla. 14. *R. pittosporaefolium.*
Flowers solitary, stamens shorter than the corolla............15. *R. Wilsonae.*

Rhododendron pittosporaefolium Hemsley in Jour. Linn. Soc. xxvi. 29 (1889).—Diels in Bot. Jahrb. xxix. 515 (1900).—Bean in Flora & Sylva, iii. 164 (1905).—Schneider, Ill. Handb. Laubholzk. ii. 509, fig. 333 (1911).—Hutchinson in Millais, Rhodod. 225 (1917).

Rhododendron stamineum Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 116.—Rehder & Wilson in Sargent, Pl. Wilson. i. 546 (1913).—Hutchinson in Bot. Mag. cxli. t. 8601 (1915).—Non Franchet.

Rhododendron aucubaefolium Hemsley in Jour. Linn. Soc. xxvi. 19 (1889), as to the flowers, the leaves and shoot belong to *Daphniphyllum macropodum* Miquel.—Bean in Flora & Sylva, iii. 162 (1905).

Bush from 2 to 8 m. tall, with many spreading, slender, glabrous branches; winter-buds narrow-ovoid, glabrous. Leaves coriaceous, tufted, lustrous, glabrous, lanceolate to oblong, rarely broadest about the middle, without petiole 6–12 cm. long, 2–5 cm. wide, acuminate, base cuneate, rarely rounded; petiole 1–1.5 cm. long. Flowers fragrant, from 3 to 8 in axillary fascicles, the fascicles several and crowded together at the end of last season's growth; pedicels slender, 1–3 cm. long, glabrous; calyx glabrous, annular, with 5 small, unequal teeth; corolla white, sometimes suffused with pink, with yellow blotch on the posterior lobes, pointed in the bud, 2.5–3.5 cm. long, deeply 5-lobed, the lobes oblong, obtuse or sub-acute, spreading and recurving from a narrow, cylindric tube; stamens 10, much exserted, filaments flattened, short-pilose in lower half, anthers oval, yellowish, pistil glabrous, overtopping the stamens, 4–5.5 cm. long, ovary cylindric, 0.6 cm. long, 0.3 cm. wide, style filiform, stigma capitate. Fruit spindle-shaped, 2.5–4 cm. long, 0.4 cm. wide, furrowed, dehiscing from below upward, margins of the valve waved; seeds shining pale brown, flattened, oval, 0.3 cm. long, winged at either end.

This is a very remarkable species easily recognized by its fascicled flowers with spreading, recurving lobes and long exserted stamens and pistil. At one time I thought it the same as *R. stamineum* Franch., a Yunnan species and they are unquestionably very closely related but *R. stamineum*, as described, has much thinner leaves, smaller pink flowers, thirteen stamens and shorter genitalia. Experience has taught us that none of the Yunnan Rhododendrons extend into central China and, indeed, very few into western Szechuan as far north as Mt. Omei. Until both species are in cultivation, where their true relationship can be positively determined, it seems best to keep the two as distinct.

Hemsley's species is well-named for in foliage and habit it singularly resembles a Pittosporum. It is a broad, spreading shrub, sometimes 25 ft. high and as much in diameter, with shining green leaves crowded at the ends of the slender but rigid shoots. When young, and especially on seedling plants, the leaves are a rich bronze or of a purple hue and strikingly handsome. Mature bushes flower abundantly and the pure white blossoms often flushed with pink are sweetly fragrant and very pretty with their long, and prominent stamens and spreading reflexed corolla-segments with a striking yellow blotch.

This is a low-level Rhododendron, wide-spread in western Hupeh to Mt. Omei and Mt. Wa in western Szechuan between elevations of from 4000 to 6000 ft. but nowhere plentiful. It also grows in southeastern Szechuan and in the southwestern part of Hunan province. It is usually found on cliffs in hot, moist valleys among an exuberant growth of shrubs, mostly evergreen in character. Specimens collected on Mt. Omei and Mt. Wa have thinner leaves which are much less obviously reticulated on the upper surface than is the case with specimens from Hupeh.

It was discovered by A. Henry between 1886 and 1888 on the borders of Changyang and Patung districts and was introduced into cultivation by seeds (No. 887) which I sent from the same locality to Messrs. Veitch in the autumn of 1900; in 1910 I sent seeds (No. 4268) from Mt. Omei to the Arnold Arboretum. Plants raised from the seeds sent in 1900 flowered for the first time in 1911 at Caerhays Castle.

Rhododendron Wilsonae Hemsley & Wilson in Kew Bull. Misc. Inform. 1910, 116.—Bean, Trees & Shrubs Brit. Isles, II. 386, (1914).—Millais, Rhodod. 262 (1917).

Bush from 1.5 to 3 m. tall with gray, slender, ascending-spreading glabrous branches; winter-buds elongate, acute with paleaceous scales. Leaves rigid-coriaceous, clustered into false verticils, ovate-lanceolate, without petiole 5–10 cm. long, 2–4 cm. wide, acuminate, base more or less cuneate, upper surface shining green, lower pale; petiole 0.5–1.2 cm. long. Flowers fragrant, solitary and axillary but clustered to form fascicles at the end of the last season's growth; pedicels glabrous, about 2 cm. long, sheathed in many shining reddish brown paleaceous, imbricated, acute bud-scales; calyx annular, 5-toothed or unequally 5-lobed, glabrous; corolla deeply 5-lobed, pink, funnelform, 2.5–3 cm. deep, 4–5 cm. wide, lobes rounded, spreading from a narrow tube, posterior lobe spotted with brown; stamens 10 of unequal length, longest as long or nearly as long as corolla, filaments flattened, slightly villose near base, anthers broadly oval; pistil glabrous, exceeding the stamens, ovary oblong, 0.7 cm. long; style slender, curved, stigma lobed. Fruit cylindric, about 3 cm. long, 0.5 cm. broad, furrowed.

This is a twiggy shrub seldom more than 6 ft. tall and very distinct with solitary, pink, deeply lobed flowers, the lobes spreading from a short narrow tube. It is the rarest of the Hupeh species, being only known from one locality in the Patung district where it grows with other shrubs and trees in rocky places between elevations of 5000 and 6500 ft. In 1917 it was found on the mountains of northern Kwangtung by Rudolf Mell. It was discovered by me late in April, 1900, and in the autumn of this same year I sent seeds (No. 886) to Messrs. Veitch. All the plants in cultivation originated from these seeds. It flowered for the first time in cultivation in March, 1912, at Caerhays Castle in Cornwall. The young leaves on seedling plants are beautifully colored, shades of brownish or purplish crimson masking the deep green of the mature leaf. In gardens, as yet, this Rhododendron has hardly fulfilled expectations.

SUBGEN. III. ANTHODENDRON ENDL.

Rhododendron subgen. **Anthodendron** Endlicher, Gen. 759 (1839).—Rehder in Wilson & Rehder, Monog. Azal. 115 (1921) where full synonymy and references with a complete description are given.

KEY TO THE SECTIONS

Flowers and leaves from the same bud.
  Shoots with flattened, appressed, bristle-like hairs; leaves persistent or sometimes deciduous, usually dimorphic, scattered on the branches, elliptic to lanceolate or oblanceolate..................................1. *Tsutsutsi.*
  Shoots glabrous or villose, without bristle-like hairs; leaves deciduous, not dimorphic, in whorls at the end of the branchlets, scattered only on vigorous shoots, usually rhombic to obovate, rarely ovate........2. *Sciadorhodion.*
Flowers from the terminal bud, leaves from lateral buds below: corolla funnelform; stamens 5....................................3. *Pentanthera.*

SECT. 1. Tsutsutsi G. DON

Rhododendron sect. **Tsutsutsi** G. Don, Gen. Syst. III. 845 (1834), excluding Nos. 30, 31, 36, 39.—Wilson in Wilson & Rehder, Monog. Azal. 22 (1921) where complete synonymy and references are given.
Represented by..16. *R. Simsii.*

Rhododendron Simsii Planchon in Fl. des Serr. IX. 78 (1854).—Wilson in Wilson & Rehder, Monog. Azal. 45 (1921), where complete references and synonymy and a full account of the species are given.

SECT. 2. SCIADORHODION REHD. & WILS.

Rhododendron subgen. **Anthodendron** sect. 2. **Sciadorhodion** Rehder & Wilson in Wilson & Rehder, Monog. Azal. 79 (1921), where complete synonymy is given.
Represented by..17. *R. Mariesii.*

Rhododendron Mariesii Hemsley & Wilson in Kew Bull. Misc. Inform. 1907, 244.—Wilson in Wilson & Rehder, Monog. Azal. 80 (1921), where complete references and synonymy and a full account of the species are given.

SECT. 3. Pentanthera G. DON

Rhododendron sect. **Pentanthera** G. Don, Gen. Syst. III. 846 (1834).—Rehder in Wilson & Rehder, Monog. Azal. 124 (1921), where full references and complete synonymy are given.
Represented by..18. *R. molle.*

Rhododendron molle G. Don, Gen. Syst. III. 846 (1834).—Wilson in Wilson & Rehder, Monog. Azal. 95 (1921), where complete references and synonymy and a full account of the species are given.

THE LIGNEOUS FLORA OF RICH MOUNTAIN, ARKANSAS AND OKLAHOMA

ERNEST J. PALMER

That part of the Ozark region lying south of the Arkansas river, using the term Ozark in its broadest application to include all of the elevated and semi-mountainous country between the Mississippi lowlands and the Great Plains, comprises two rather distinct sub-regions, differing from each other in topography and geologic structure, as likewise from the more typical mountain and plateau sections to the north. On the eastern side in south-central Arkansas, the name Ouachita Mountains has been applied to a series of low hills separated by narrow rocky valleys, formed upon a varied series of early Paleozoic rocks ranging from shales, sandstones and quartzites to massive novaculite chert. These strata have been broken up, tilted and folded in a complex manner, and in places masses and dikes of eruptive rocks have been forced into them. Farther west in Arkansas and extending into eastern Oklahoma very different conditions are encountered. Here the mountain-making movements of late Cretaceous time, although probably connected with other disturbances on a larger scale beyond our area, seem locally to have spent their force in a series of radiating or parallel lines of faulting and upheavals, while leaving considerable sections of the country but little disturbed. The different nature of the strata encountered here, consisting of heavily bedded sandstones alternating with shale and occasional layers of coal and clay partings, of the Pennsylvanian series, has resulted after a long period of erosion in a quite distinct topography. The traveler entering this country from the north, after crossing the Boston Mountains in western Arkansas or skirting them in eastern Oklahoma, will be impressed at once with the change in the landscape. Instead of an extremely rugged country with a close alternation of hills, ridges and narrow valleys, all rather heavily wooded and with but little evidence of civilization or settlement, he here finds broad open spaces and rivers flowing not through wide alluvial valleys, except in the case of the Arkansas, but through level uplands of moderate elevation, many miles in extent, sparsely wooded and dotted over with villages and farms, while on all sides can be seen on the horizon the outlines of more or less distant ranges or isolated peaks and domes of conical or long canoe-shaped mountains.

Thomas Nuttall, the English naturalist, who came up the Arkansas river in 1819, and who was the first scientific traveler to visit this section, described the park-like aspect of the country in its then primitive condition, with its alternation of grassy prairies and groves of small trees, amongst which great herds of antelope and deer were grazing, and with buffalo and bear abundant at no great distance. In his Journal of travels, published in Philadelphia in 1821, there are also illustrations, from sketches made by the author, of several of the prominent mountains, including